Memo For Record 22 Mar 94

SUBJ: CDFS II Library Items Description

WHAT: System utilization statistics and software model runtimes

WHY: Assist offerors size/cost their proposals from a systems engineering perspective.

DISCUSSION

This package contains wall time run times for the major CDFS II core and Incremental Technology Insertion (ITI) software modules. Combined with the accompanying host system's CPU, I/O, and memory utilization snapshot statistics, we hope offerors can glean valuable information for hardware sizing estimates. PLEASE NOTE the different temporal resolution of statistics for unclassified vs classified systems. The differences are due to the unique methods of statistical extraction available on each system.

ATCH 1 contains our unclassified system ("system 5") model run times for an 18 hour period on 3 May 93. On that day, the average: CPU allocation was 66.3%, I/O DLOCK = 18%, I/O REQ/SEC = 72, I/O KWORDS = 150, MEM = 52.9%, CHR = 83.0%, DA LFR = .91, and NUM JOBS = 1351. Definitions of each statistic are at **ATCH 2**. Note also that the cloud analysis model statistics are for the CURRENT analysis model, vice the new model to be delivered under this contract based on the SERCAA algorithms.

ATCH 3 contains similar information for the classified system ("system 3") for a 24 hour period. The 18 Mar 94 cover memo is self-explanatory.

NORMAN H. MANDY, Capt, USAF
AFGWC CDFS II Project Manager

3 ATCH:
1. System 5 Model statistics
2. Statistics Definitions
3. System 3 Model Statistics and Definitions

05 Mar 1994

MEMORANDUM FOR SYPA (Capt Mandy)

FROM:SYSS(MSgt Stewart 47437).

SUBJECT: Processing Time of Mission Sensor and Synapse Software

1. The attachments should answer all of your questions in regard to processing time. We felt that it was important to have other measures of central tendencies listed beside the average. This will help a contractor get a better feel for our processing times.

2. Please note that the number of runs are dependent on how many satellites are processing on our system. However, each satellite will initiate 14 processing cycles per day. If any quality control parameters are not met then we will receive additional processing runs. These additional processing runs can happen as often as 14 times per day or not at all.

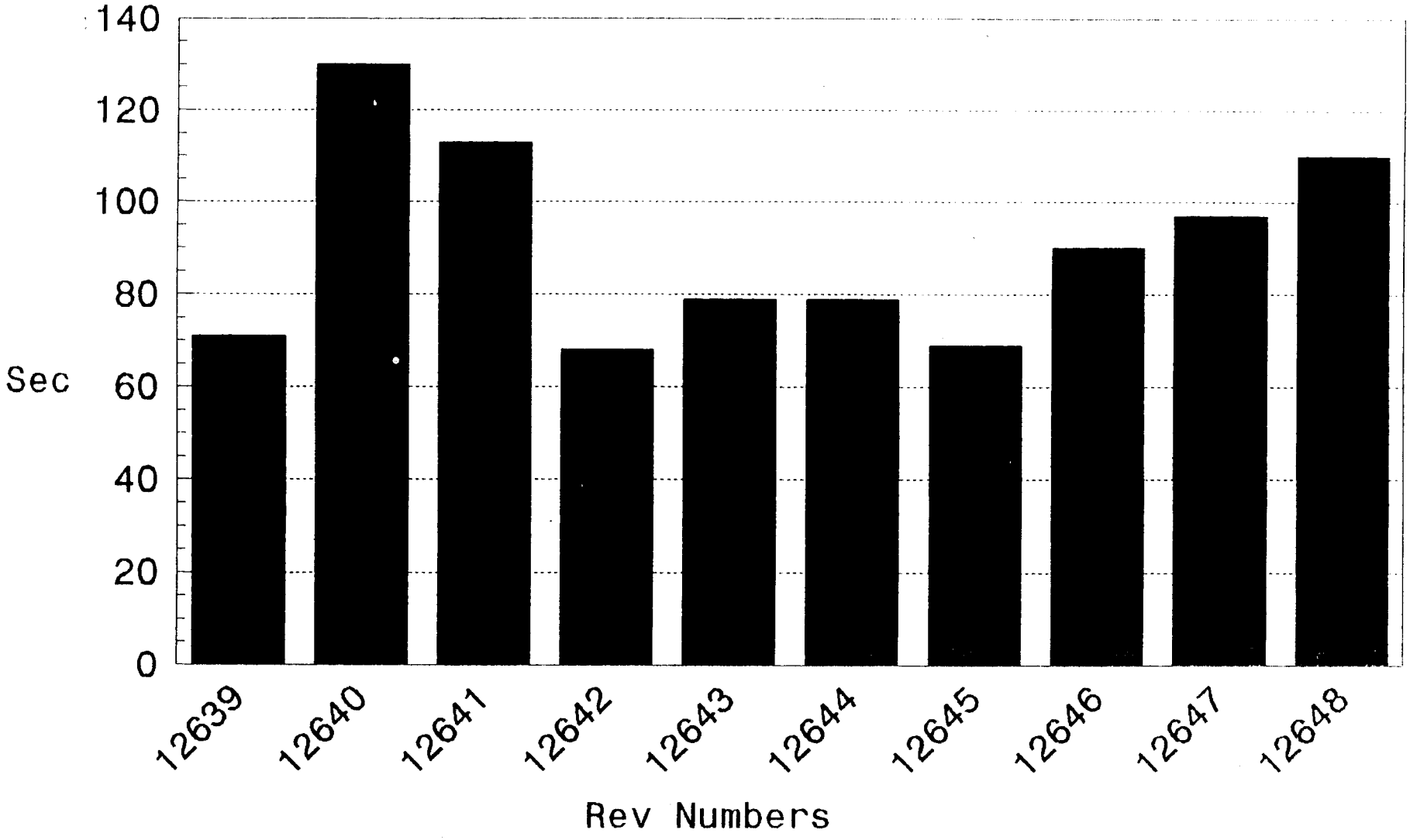
3. If you have any questions, please call.

Andrew P. Boerlage, Capt, USAF
Chief, Weather Satellite Data Processing

Attachments.
1.SSMT Processing Time in Seconds
2.SST2 Processing Time in Seconds
3. SSPRCV Processing Time in Seconds
4.SSMI Processing Time in Seconds
5. SSIMPL Archival Programs Processing Time
6.SSIMPL Separation of Sensor Data in to Prepfiles
7.SSIMPL External Transfers Processing Time in Seconds
8. Synapse Processing Time

SSMT Processing Time in Seconds

Mean:91 Min:68 Max:130 Median:85 SD:20

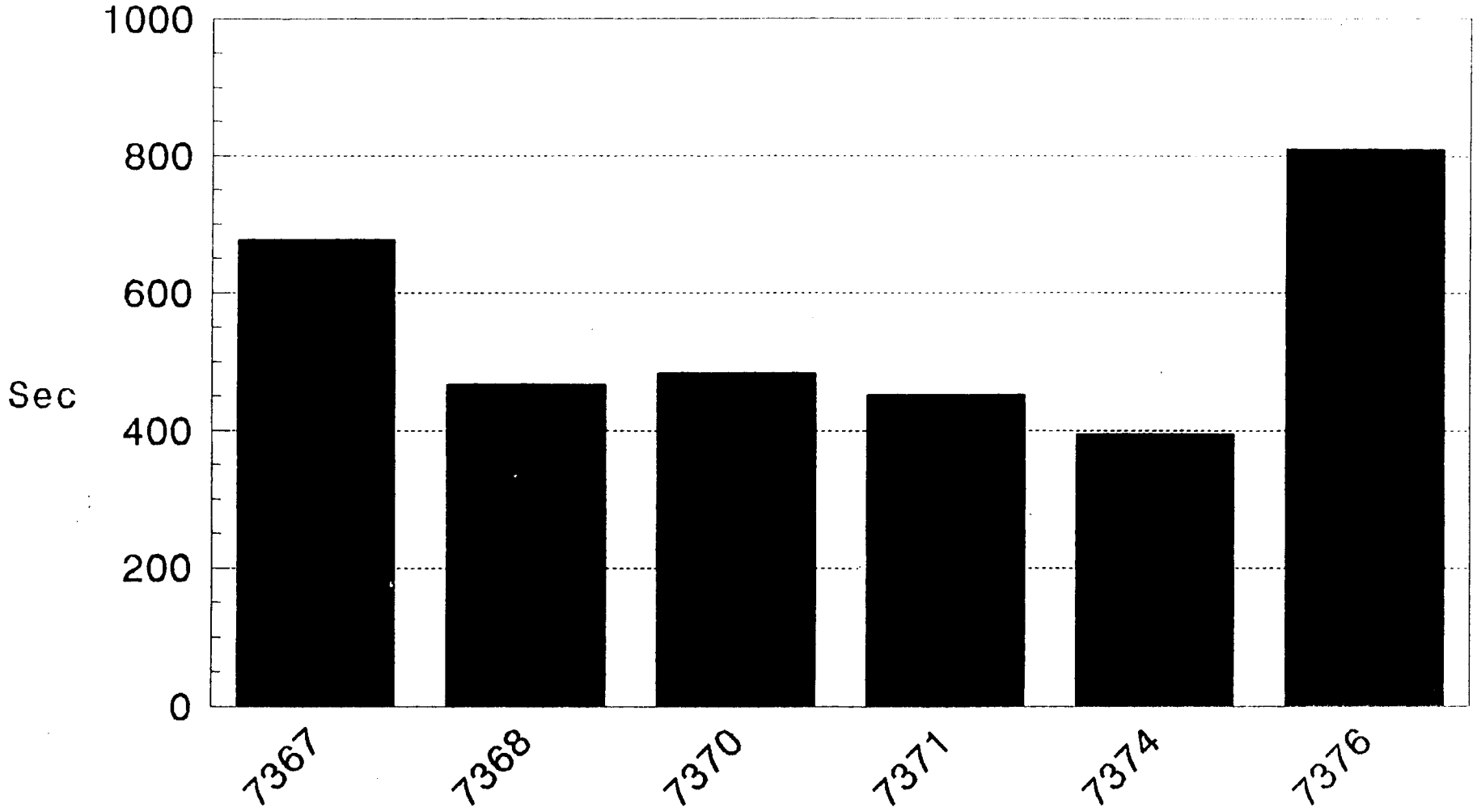


May 3rd, 1993 00z - 18z

Prepared by: MSgt Stewart/SYSS/47437

SST2 Processing Time in Seconds

Mean:475 Min:394 Max:810 Median:475 SD:146

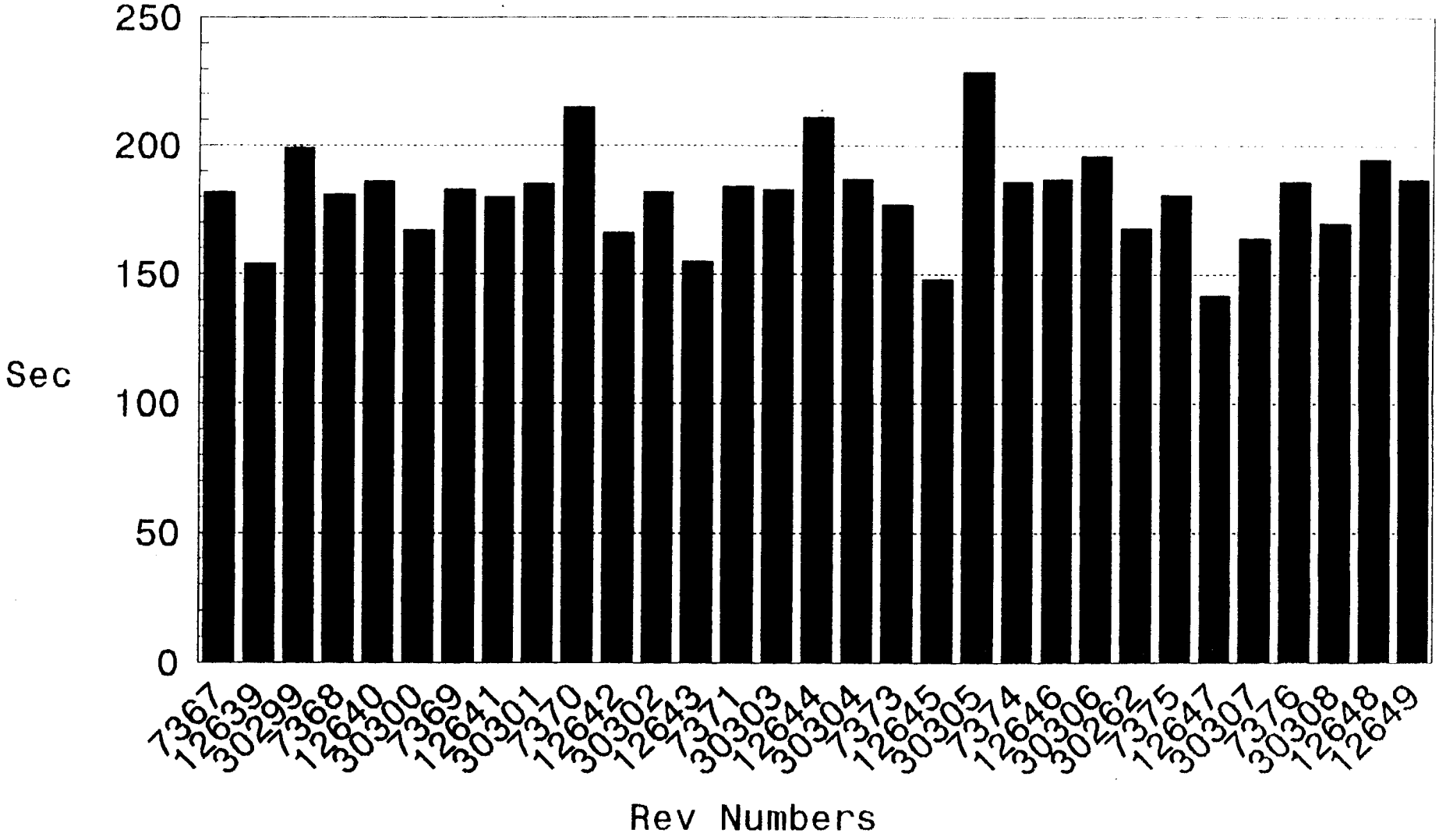


Note: T2 is only on one satellite. This includes the MT Preprocessing Time

Prepared by: MSgt Stewart/SYSS/47437

SSPRCV Processing Time In Seconds

Mean:181 Min:142 Max:229 Median:183 SD:18

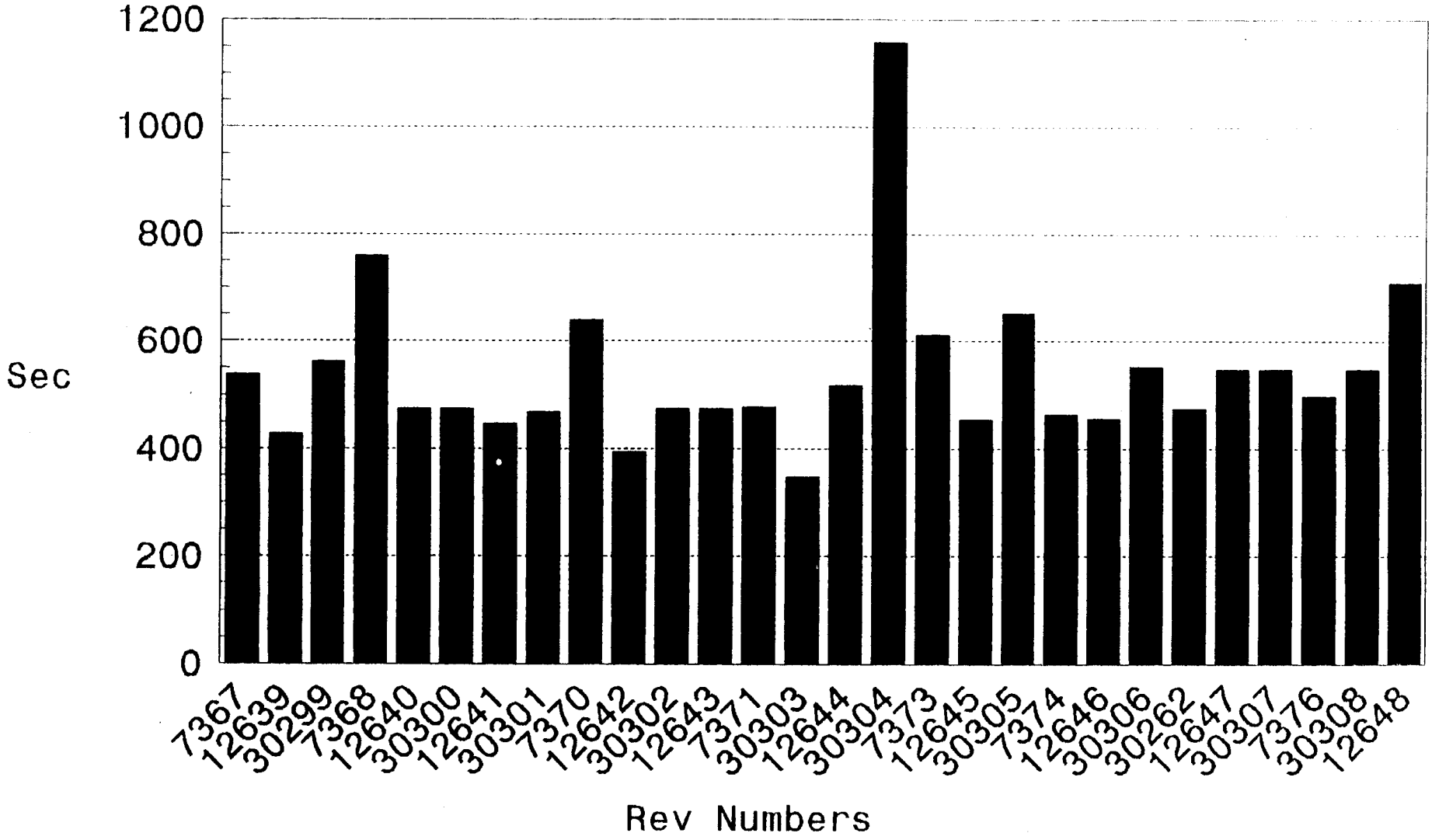


May 3rd, 1993 (00z to 18z)

Prepared by: MSgt Stewart/SYSS/47437

SSMI Processing Time In Seconds

Mean:540 Min:347 Max:1158 Median:487 SD:148



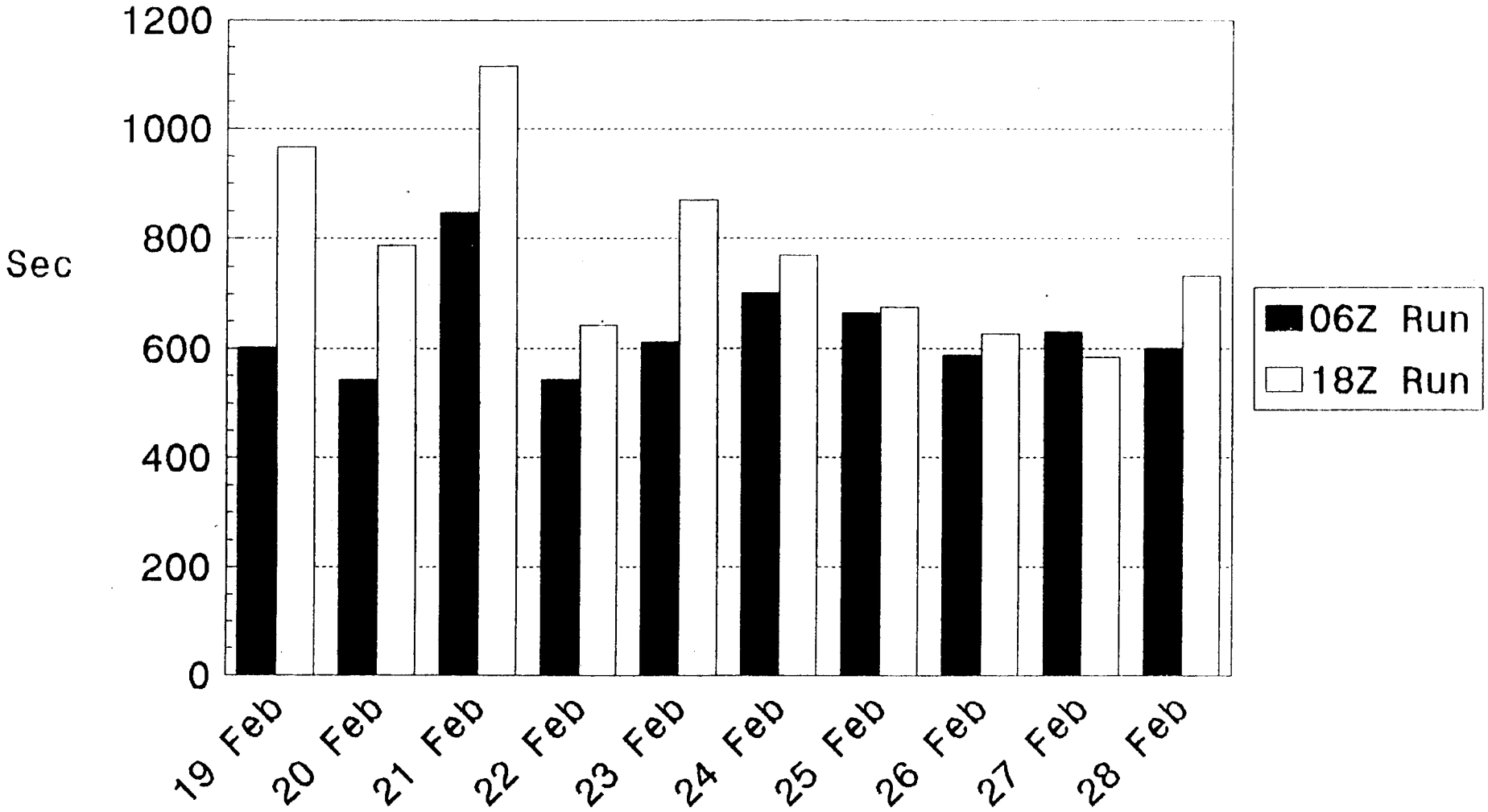
May 3rd, 1993 (00z to 18z)

Prepared by: MSgt Stewart/SYSS/47437

SSIMPL Archival Programs Processing Time (1994)

06z RUN: Mean:633 Min:543 Max:847 Median:606 SD:85

18z RUN: Mean:777 Min:583 Max:1116 Median:751 SD:158

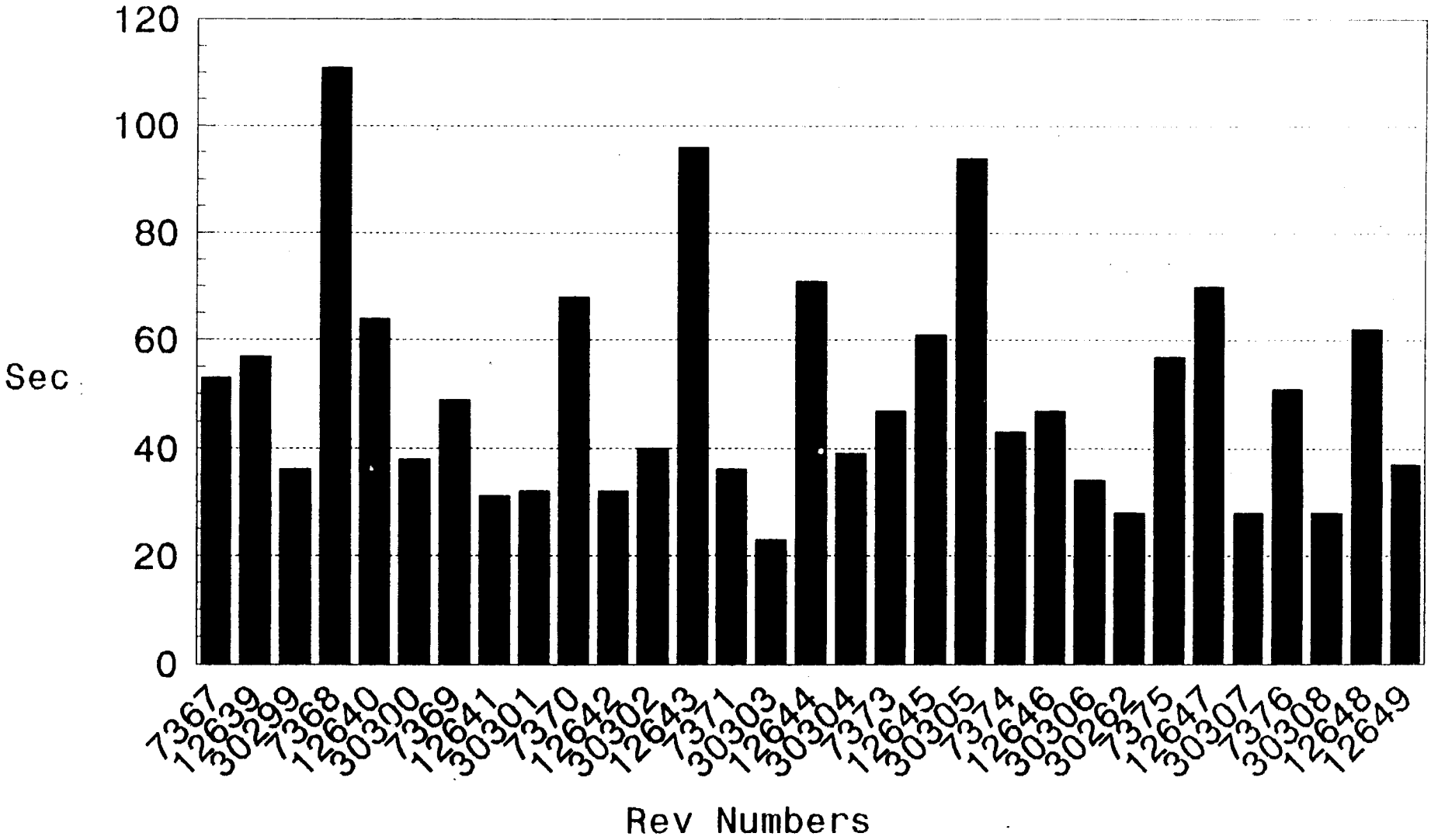


Prepared by: MSgt Stewart/SYSS/47437

SSIMPL SEPARATION OF SENSOR DATA INTO PREPFILES

SSPSRT Processing Time In Seconds

Mean:50 Min:23 Max:111 Median:47 SD:21

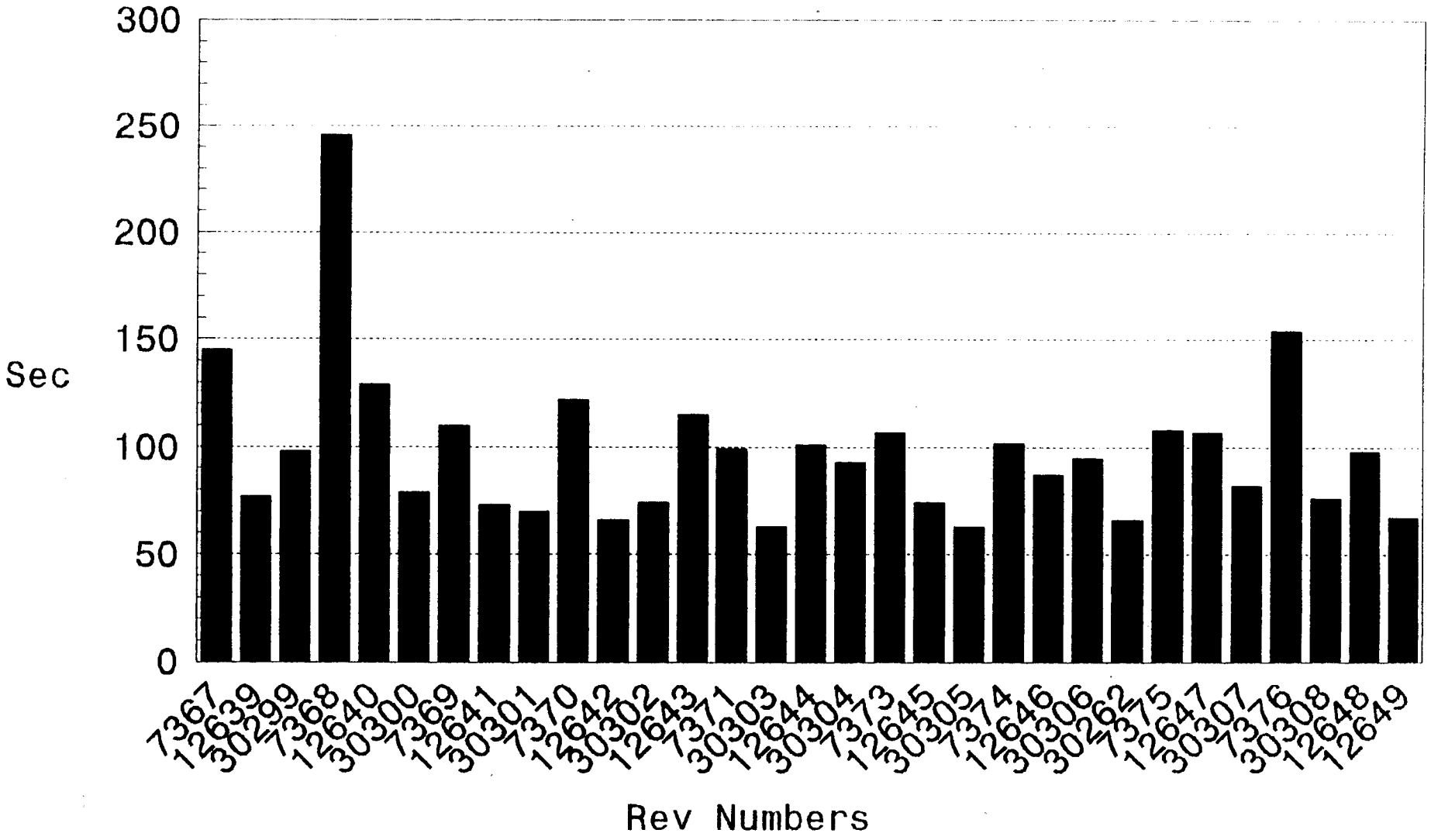


May 3rd, 1993 (00z to 18z)

Prepared by: MSgtStewart/SYSS/47437

SSIMPL External Tranfers Processing Time In Seconds

Mean:98 Min:63 Max:246 Median:95 SD:35



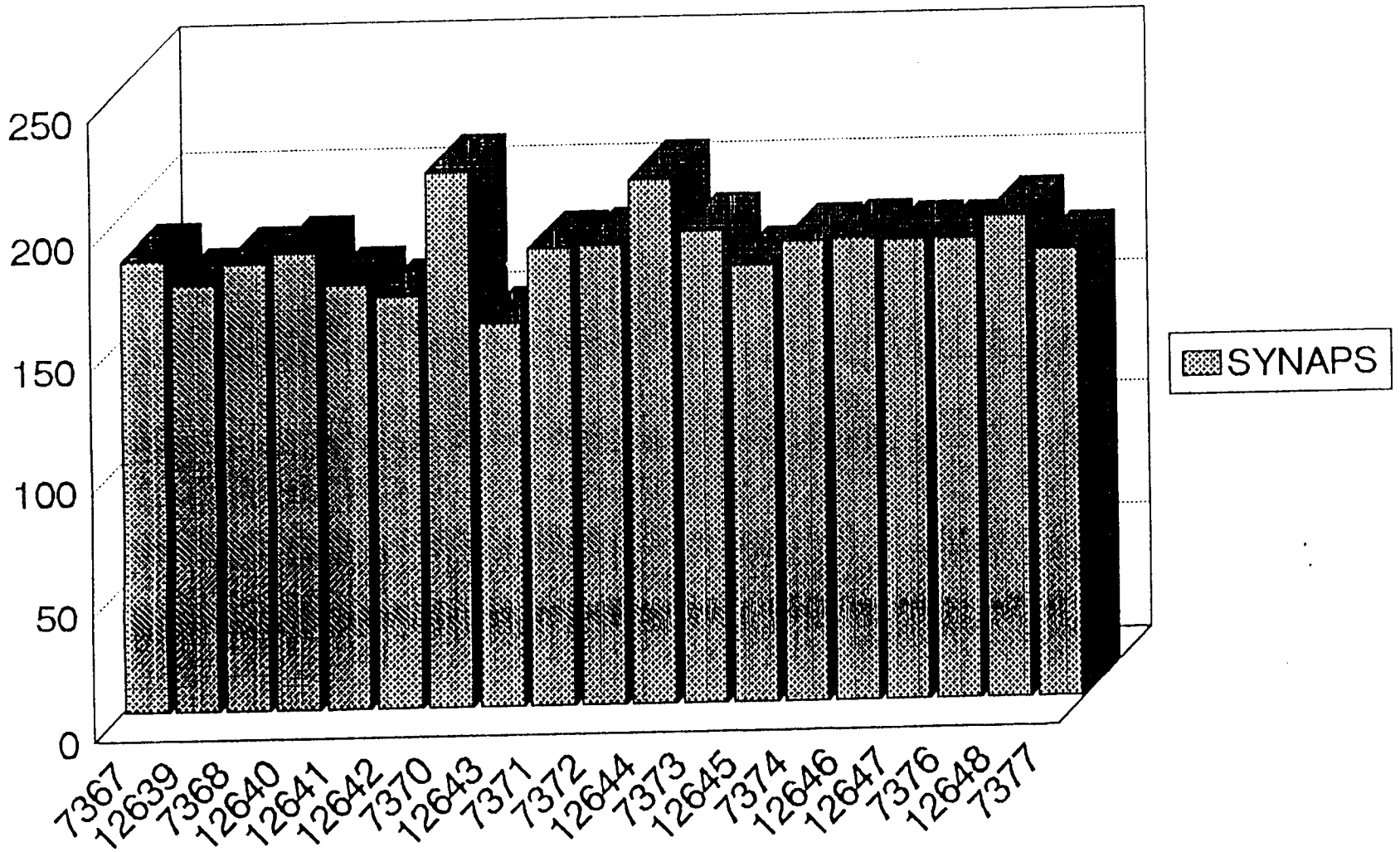
May 3rd, 1993 (00z to 18z)

Prepared by: MSgt Stewart/SYSS/47437

Synapse Processing Time

OLS Throuhput in Seconds

(From beginning ingest time to "Data Take Complete" Msg)



May 3 00z to May 3 18z (System 5 1100/90)

7 Feb 94

MEMORANDUM FOR SYPA (Capt Mandy)

FROM: SYSM

SUBJECT: Model Runtimes for CDFS II Pre-planning Package

1. We have completed the task of determining runtime statistics for the meteorological models that ran on Systems 3 and 5 during 3 May 1993. This information was requested for the CDFS II library to help the bidders better access future processing requirements. The attached memos provide data on the number of runs and average runtimes for the RTNEPH, SFCTMP, SNODEP, HRCP, 5LAYER/TRONEW, and AGRMET models.

THOMAS J. NEU, Capt, USAF
Acting Chief, Meteorological Models

Attachments:
1. Cloud Analysis Model Runtimes
2. Cloud Forecast Model Runtimes
3. Analysis Model Runtimes
4. AGRMET Model Runtimes

MEMO FOR RECORD 29 Dec 1993

SUBJ: Cloud Analysis Model Runtimes

1. This MFR is the response to the SYPA request for information on the runtimes for cloud analysis models for the CDFS II RFP support. Below is a list of the number of runs and a representative average of these runs for the cloud analysis model for the time period 00z - 18z on 3 May 93.

Model **Process**	Number of Runs	Average Run Times
Non-Sprint RINEPH (NEFSAT or NEFSAT & NEFMRG)	103	230.7 seconds
Sprint RINEPH (includes NEFSAT, NEFMRG and Bogus)	35	1461.1 seconds (76.8% due to manual bogus)
Update RINEPH (NHNEF and SHNEF plus I/O to tape)	12	700 - 900 seconds (range due to manual tape loading, etc.)
Conventional Analysis (CONRIN)	18	240 seconds
Shared Processing Network (SPNEPH)	6	90 seconds
Temperature databasing (NEFTMP)	2	90 seconds

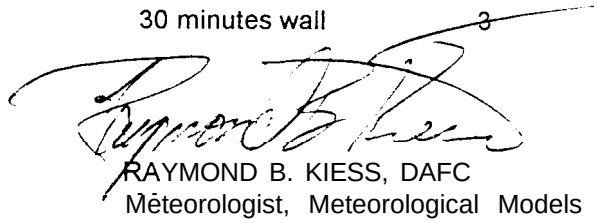
PETER J. BROIL, Capt, USAF
Systems Analyst, Meteorological Models

MEMORANDUM FOR RECORD 3 Jan 94

SUBJ: Cloud Forecast Model Runtimes

This MFR is the response to the SYPA request for information on the runtimes for cloud forecast models for the CDFS II RFP support. Below is a list of the number of runs and a representative average of these runs for the cloud forecast models for the time period 00z-18Z on 3 May 93. HRCP statistics were gathered on 00z-12Z on 2 Jan 94.

Model Process	Number of Runs	Average Run Times	Svstem
NH5LYR (On cycle, 3,9,15Z)	3	20 minutes wall	5
NH5LYR (Off cycle, 0,6,12Z)	3	7 minutes wall	5
SH5LYR (On cycle, 3,9,15Z)	3	13 minutes wall	5
SH5LYR (Off cycle, 0,6,12Z)	3	5 minutes wall	5
TRONEW	12	0.5 minutes wall	5
HRCP	30	5 minutes wall	3
PREHCP	8	30 minutes wall	3



RAYMOND B. KIESS, DAFC
Meteorologist, Meteorological Models

MEMO FOR RECORD 5 Jan 1994

SUBJ: Analysis Model Runtimes

1. This MFR is the response to the SYPA request for information on the runtimes for the surface temperature model (SFCIMP) and the snow analysis model (SNODEP). Below is a list of the number of runs for these models for the time period 00z - 18z 3 May 93.

Model Process	Number of Runs	Average Run Times
SFCIMP (NH)	6	49 minutes wall
SFCIMP (SH)	6	28 minutes wall
SNODEP	1	3 minutes wall

DR. THOMAS J. KOPP,DAFC
Meteorologist, Meteorological Models

MEMORANDUM FOR RECORD 6 Jan 94

SUBJ: AGRMET Model Run Times

1. This MFR is in response to the SYPA request for information about the run times for various AFGWC analysis and forecast models for the CDFS II RFP support.

2. Listed below are the AGRMET model runstreams, the number of times they are run each day, their approximate average run time (in seconds), and the system on which they run.

AGRMET Runstream	Number of runs	Approximate Average Run Time	System
BOSS (OOZ)	1	40005250	5
BOSS (06Z, 18Z)	2	500	5
BOSS (12Z, Mon)	1	11250	5
BOSS (12Z, Wed, Fri)	1	3300-5500	5
BOSS (12Z, Tue, Thu, Sat, Sun)	1	3000-5300	5
SMIRUN (OOZ PE 3 hrs)	8	100	5

3. These statistics were derived from the 3 May 93 listing provided by SYPA and from other statistics for the period 1- 6 Jan 94. The latter statistics were necessary because the 3 May 93 listing was not long enough to allow calculation of all the required times.

4. The average run times shown above will likely change after an upcoming implementation in February, 1994.

Brian A. Moore, DAFC
Meteorologist

Capt Mead

Definitions of Statistics taken from Mainframes

These definitions were derived from UNISYS OS 1100 Performance Analysis Routines End Use Reference Manual, and from discussion with Mr. Gary Schiebel of UNISYS. If further clarification is required please see the above reference manual (section 5) or Mr. Schiebel.

CPU% – The allocation of CPU activity.

I/O DLOCK – Percentage of time that CPU's are idle and waiting for I/O completion.

I/O REQ/SEC – The total number of I/O requests per second across the entire system for the time interval specified.

I/O KWORDS – Total data transfers to all devices expressed in thousands of words.

MEM% – Total memory use by all processors.

~~BMIT~~ –

CHR – The percentage of all cached request types that were in cache. An asterisk indicates that cache was not up during the entire session. The Hit rate is derived by adding the total number of requests for read hits and write hits, and dividing the total requests.

DALFR – (Dynamic Allocator Load Failures) The percentage of DA attempts that resulted in a failure to satisfy the request.

NUM JOBS – The total number of runs and transactions opened during the SIP collection.

****Note** : All numbers are a starting point or good baseline.

13 March 1994

MEMORANDUM FOR RECORD

SUBJECT: System Utilization Statistics for System 3

1. To get a representative sample of system utilization on System 3, statistics were produced by UNISYS (Mr Schiebel) for a 24 hour period (15-16 March) using the UNISYS utility OSAM. Using these system statistics, coupled with the wall times of the operational software run during the same time period, AFGWC/SYSP (Mr McElhaney) produced an overall set of statistics, given as Atch 1.

2. The statistics contain the following five columns for each process:

a. Day/Time: When process was started. Days were 15-16 March 94.

b. Time (sec): Wall time of each process.

c. Mass storage I/O per sec: Number of I/O calls per second.

d. Memory Utilization: Avg percent utilization during process.

e. Processor Utilization: Avg percent utilization during process.

3. Caveats for statistics given for the System 3 processes:

a. HRCP: Statistics are given separately for N HRCP (Northern hemisphere), S HRCP (Southern hemisphere), and PREHCP (Interpolation process which runs every 3 hours). As these processes do not run together, the statistics are given independently_

b. BOGUS: This processes data fields bogused by the forecasters on SDHS. Note that this process logically falls under NP5.

Michael Farrar

MICHAEL R. FARRAR, Capt, USAF
Project Manager, Systems Acquisitions

Attachments:
1. Statistics (4 pages)

cc: SYPA (Capt Mandy), SYSP (Mr. McElhaney)
SYSM (Cloud Models, ASPAM)
Aerospace (M. Plonski)

S YSM PROCESSES

N HRCP	time (sec)	mpss storage i/o per sec	memory utilization (%)	processor utilization (%)
15/1521	344	30	50	70
15/1551	228	60	40	10
1511555	173	60	40	10
1511832	287	40	25	40
1512123	525	30	30	60
1512124	575	30	30	60
15/2149	434	40	40	60
16/0019	378	50	35	60
1610338	298	35	40	30
1610347	170	25	25	15
16/0617	342	25	25	75
1610838	456	25	55	75
16/1140	285	25	50	60
16/1212	519	25	30	40
16/1214	565	25	30	40
COUNT	15.00	15.00	15.00	15.00
AVG	371.93	35.00	36.33	47.00
STD DEV	135.62	12.54	9.72	22.58

S HRCP

15/1610	283	30	50	70
1512150	457	30	40	50
16/0016	422	35	50	50
1610330	313	3 5	40	30
16/0614	293	25	25	75
16/0827	323	15	25	20
COUNT	6.00	6.00	6.00	6.00
AVG	348.50	28.33	38.33	49.17
STD DEV	72.74	7.53	11.25	21.54

PREHCP

15/1811	1126	50	50	80
1512047	1274	30	50	60
15/2352	1051	40	40	60
1610710	1387	30	35	50
1610723	651	20	50	75
16/0914	1043	30	50	75
16/1113	1455	25	50	60
16/1403	1087	25	40	70
COUNT	8.00	8.00	8.00	8.00
AVG	1134.25	31.25	45.63	66.25
STD DEV	249.97	9.54	6.23	10.26

SYSM ASPAM

Date	time (sec)	mass storage i/o per sec	memory utilization (%)	processor utilization (%)
1512047	314	30	50	60
1512054	335	30	50	60
16/0801	175	15	25	20
1610806	179	15	25	20
COUNT	4.00	4.00	4.00	4.00
AVG	250.75	22.50	37.50	40.00
STD DEV	85.61	8.66	14.43	23.09

RTOS PERIPHERALS

15/1601	11	60	30	40
15/1601	16	60	30	40
1512052	7	30	50	60
1512054	7	30	50	60
15/2100	7	30	50	60
1512106	7	30	50	60
15/2115	8	30	30	70
15/2134	7	60	30	10
1512353	9	40	40	60
1610038	6	40	30	20
1610027	8	50	35	60
16/0351	6	25	25	15
16/0400	8	25	25	15
1610531	6	20	25	10
1610616	8	25	25	75
COUNT	15.00	15.00	15.00	15.00
AVG	8.07	37.00	35.00	43.67
STD DEV	2.55	13.99	10.18	23.56

SYSP

NP4	(time)	mass storage i/o per sec	memory utilization (%)	processor utilization (%)
1511855	**14**	**60**	**40**	**75**
1512051	**14**	**30**	**50**	**60**
1610310	**17**	**30**	**30**	**40**
16/0615	**27**	**25**	**25**	**75**
1610738	**14**	**30**	**60**	**70**
16/1216	**18**	**35**	**60**	**80**
COUNT	**6.00**	**6.00**	**6.00**	**6.00**
AVG	**17.33**	**35.00**	**44.17**	**66.67**
STD DEV	**5.05**	**12.65**	**14.97**	**14.72**

NP5 APPS				
15/1536	**105**	**60**	**40**	**10**
1511603	**85**	**60**	**30**	**40**
15/1622	**28**	**40**	**25**	**20**
1512140	**97**	**60**	**30**	**10**
16/0341	**105**	**35**	**40**	**30**
COUNT	**5.00**	**5.00**	**5.00**	**5.00**
AVG	**84.00**	**51.00**	**33.00**	**22.00**
STD DEV	**32.36**	**12.45**	**6.71**	**13.04**

SYSP ASPAM				
15/1637A	97	**40**	**25**	**20**
15/2054A	**6**	**30**	**50**	**60**
15/2100A	**6**	**30**	**50**	**60**
15/2136A	**98**	**60**	**30**	**10**
16/0744A	**113**	**30**	**60**	**70**
16/1218A	**94**	**35**	**60**	**80**
COUNT	**6.00**	**6.00**	**6.00**	**6.00**
AVG	**69.00**	**37.50**	**45.83**	**50.00**
STD DEV	**49.24**	**11.73**	**14.97**	**28.28**

SYSP

BOGUS	time (sec)	mass storage i/o per sec	memory utilization (%)	processor utilization (%)
15/2110	15	30	30	70
15/2126	15	30	30	70
1512352	18	40	40	60
1512355	16	40	40	60
16/0002	16	35	50	50
1610044	15	40	30	20
1610044	15	40	30	20
16/0317	16	30	30	40
1610329	17	30	50	80
16/0340	15	35	40	30
1610341	19	35	40	30
1610404	15	25	25	15
1610405	12	25	25	15
1610542	17	20	25	10
16/0623	16	25	25	75
COUNT	15.00	15.00	15.00	15.00
AVG	15.80	32.00	34.00	43.00
STD DEV	1.61	6.49	8.70	24.70